What is Claimed Is:

1. A method of inhibiting the proliferation of a microbial population or microbial colonization of a human or animal patient, comprising the steps of:

(a) providing the human or animal patient having a skin injury or a surface lesion;

(b) contacting the skin injury or the surface lesion with an antimicrobial composition, wherein the composition comprises a pharmaceutically acceptable antimicrobial agent, a pharmaceutically acceptable chelating agent, a pharmaceutically acceptable pH buffering agent, and a pharmaceutically acceptable carrier; and

(c) inhibiting the proliferation of a microbial population of the skin injury or the surface lesion of the human or animal patient.

2. The method of Claim 1, further comprising the steps of:

(a) identifying the microbial population;

(b) identifying an antibiotic capable of inhibiting the proliferation of the microbial population;

(c) determining the MIC and FIC values for the antibiotic and the chelating agent; and

(d) adjusting the concentration of the antibiotic and the chelating agent of the antimicrobial composition to inhibit the proliferation of the microbial population

3. The method of Claim 1, wherein the pharmaceutically acceptable chelating agent is selected from the group consisting of ethylenediamenetetracetic acid (EDTA), triethylene tetramine dihydrochloride (TRIEN), ethylene glycol-bis (beta-aminoethyl ether)–N, N, N', N'–tetracetic acid (EGTA), diethylenetriamin-pentaacetic acid (DPTA), triethylenetetramine hexaacetic acid (TTG), deferoxamine, Dimercaprol, edetate calcium disodium, zinc citrate, penicilamine succimer and Editronate.

4. The method of Claim 1, wherein the pharmaceutically acceptable chelating agent is further selected from the group consisting of ethylenediamenetetracetic acid (EDTA), triethylene tetramine dihydrochloride (TRIEN), ethylene glycol-bis (beta-aminoethyl ether)–N, N, N', N'–tetracetic acid (EGTA), diethylenetriamin-pentaacetic acid (DPTA), and triethylenetetramine hexaacetic acid (TTG).

5. The method of Claim 1, wherein the pharmaceutically acceptable chelating agent is ethylenediamenetetracetic acid (EDTA).

6. The method of Claim 1, wherein the pharmaceutically acceptable chelating agent is triethylene tetramine dihydrochloride (TRIEN).

7. The method of Claim 1, wherein the pharmaceutically acceptable

antimicrobial agent is an antibiotic selected from the group consisting of a β-lactam, an aminoglycoside, a vancomycin, a bacitracin, a macrolide, an erythromycin, a lincosamide, a chloramphenicol, a tetracycline, a gentamicin, an amphotericin, a cefazolin, a clindamycin, a mupirocin, a nalidixic acid, a sulfonamide and trimethoprim, a streptomycin, a rifampicin, a metronidazole, a quinolone, a novobiocin, a polymixin and a Gramicidin.

8. The method of Claim 7 wherein the pharmaceutically acceptable antimicrobial agent is further selected from the group consisting of a β-lactam, an aminoglycoside, a vancomycin, a chloramphenicol, an erythromycin, a tetracycline, gentamicin, nalidixic acid and a streptomycin.

9. The method of Claim 1, wherein the pharmaceutically acceptable antimicrobial agent is oxytetracycline.

10. The method of Claim 1, wherein the pharmaceutically acceptable antimicrobial agent is amikacin.

11. The method of Claim 1, wherein the pharmaceutically acceptable antimicrobial agent is neomycin.

12. The method of Claim 1, wherein the pharmaceutically acceptable antimicrobial agent is biologically active against a Gram-negative bacterial species.

13. The method of Claim 1, wherein the pharmaceutically acceptable antimicrobial agent is biologically active against a Gram-positive bacterial species.

14. The method of Claim 1, wherein the microbial population is a bacterial infection comprising at least one Gram-negative bacterial genus selected from the group consisting of *Aeromonas, Pseudomonas, Escherichia, Enterococcus, Yersinia, Vibrio, Flexibacter, Nocardia, Flavobacterium, Edwardsiella* and *Cytophagia.*

15. The method of Claim 1, wherein the microbial population is a bacterial infection comprising at least one Gram-positive bacterial genus selected from the group consisting of *Bacillus, Staphylococcus, Streptococcus, and Mycobacterium.*

16. The method of Claim 1, wherein the pharmaceutically acceptable pH buffering agent comprises Tris (hydroxymethyl) aminomethane (TRIZMA Base).

17. The method of Claim 1, wherein the antimicrobial composition further comprises vitamin E.

18. The method of Claim 1, wherein the skin injury is a burn.

19. The method of Claim 1, wherein the skin injury is an abrasion.

20. The method of Claim 1, wherein the skin injury is an ulcer.

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21. The method of Claim 1, wherein the surface lesion is a lesion of the oral mucosa of a human or animal patient.

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22. The method of Claim 1, wherein the antimicrobial composition is a mouthwash for inhibiting the proliferation of a microbial population of the oral cavity of a human or animal.

23. A medical dressing for delivering an antimicrobial composition to a skin injury or lesion in a human or animal, comprising:

a support; and

an antimicrobial composition comprising at least one pharmaceutically acceptable antimicrobial agent, at least one pharmaceutically acceptable chelating agent, and at least one pharmaceutically acceptable pH buffering agent.

24. The medical dressing of Claim 23, wherein the support is sterile.

25. The medical dressing of Claim 23, wherein the support is selected from the group consisting of woven fabrics of naturally occurring fibers, woven fabrics of man-made fibers, non-woven fabrics of naturally occurring fibers, non-woven fabrics of man-made fibers, strands of naturally occurring fibers, strands of man-made fibers,

interconnected strands of man-made fibers and interconnected strands of naturally occurring fibers, polymer foams, naturally occurring or synthetic sponges, a biologically acceptable gel, and a membrane.

26. The medical dressing of Claim 23, wherein the support is a gauze material.

27. The medical dressing of Claim 23, wherein the support is a physiologically acceptable gel.

28. The medical dressing of Claim 23, wherein the membrane is a monolayer or a laminate, and wherein the membrane is comprised of a non-synthetic material, a synthetic material, or a combination thereof.

29. The medical dressing of Claim 23, wherein the antimicrobial composition impregnates the support.

30. The medical dressing of Claim 23, wherein the antimicrobial composition forms at least one layer on at least one surface of the support.

31. The medical dressing of Claim 23, wherein the support selected from the group consisting of a film, a moldable plastic or resin, gauze, and fabric, and wherein the support is suitable for contacting a surface lesion in the mouth of a human

or animal.

32. The medical dressing of Claim 23, wherein the pharmaceutically acceptable chelating agent is selected from the group consisting of ethylenediamenetetracetic acid (EDTA), triethylene tetramine dihydrochloride (TRIEN), ethylene glycol-bis (beta-aminoethyl ether)–N, N, N', N'–tetracetic acid (EGTA), diethylenetriamin-pentaacetic acid (DPTA), triethylenetetramine hexaacetic acid (TTG), deferoxamine, Dimercaprol, edetate calcium disodium, zinc citrate, penicilamine succimer and Editronate.

33. The method of Claim 23, wherein the pharmaceutically acceptable chelating agent is further selected from the group consisting of ethylenediamenetetracetic acid (EDTA), triethylene tetramine dihydrochloride (TRIEN), ethylene glycol-bis (beta-aminoethyl ether)–N, N, N', N'–tetracetic acid (EGTA), diethylenetriamin-pentaacetic acid (DPTA), and triethylenetetramine hexaacetic acid (TTG).

34. The medical dressing of Claim 23, wherein the pharmaceutically acceptable chelating agent is ethylenediamenetetracetic acid (EDTA).

35. The medical dressing of Claim 23, wherein the pharmaceutically acceptable chelating agent is triethylene tetramine dihydrochloride (TRIEN).

36. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is an antibiotic selected from the group consisting of a β-lactam, an aminoglycoside, a vancomycin, a bacitracin, a macrolide, an erythromycin, a lincosamide, a chloramphenicol, a tetracycline, a gentamicin, an amphotericin, a cefazolin, a clindamycin, a mupirocin, a nalidixic acid, a sulfonamide and trimethoprim, a sreptomycin, a rifampicin, a metronidazole, a quinolone, a novobiocin, a polymixin and a Gramicidin.

37. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is further selected from the group consisting of a penicillin, an aminoglycoside; a vancomycin, a chloramphenicol, an erythromycin, a tetracycline, gentamicin, nalidixic acid; and a streptomycin.

38. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is oxytetracycline.

39. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is selected from neomycin, amikacin and gentamicin.

40. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is neomycin.

41. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is amikacin.

42. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is biologically active against Gram-negative bacterial species.

43. The medical dressing of Claim 23, wherein the pharmaceutically acceptable antimicrobial agent is biologically active against a Gram-positive bacterial species.

44. The medical dressing of Claim 23, wherein the pharmaceutically acceptable pH buffering agent comprises Tris (hydroxymethyl) aminomethane (TRIZMA Base).

45. The medical dressing of Claim 23, wherein the pharmaceutically acceptable pH buffering agent in solution adjusts the antimicrobial composition to a pH of about 7.0 to about 9.0.

46. The medical dressing of Claim 44, wherein the pharmaceutically acceptable pH buffering agent in solution further adjusts the antimicrobial composition to a pH of about 8.0.

47. The medical dressing of Claim 23, wherein the antimicrobial composition further comprises vitamin E.

48. A method for administering an antimicrobial agent to a human or animal having a skin injury or surface lesion, comprising the steps of:

a) identifying a skin injury or surface lesion of a human or an animal patient;

b) providing a medical dressing for delivering an antimicrobial composition to the skin injury or surface lesion, wherein the medical dressing comprises a support and an antimicrobial composition, wherein the antimicrobial composition comprises at least one pharmaceutically acceptable antimicrobial agent, at least one pharmaceutically acceptable chelating agent and at least one pharmaceutically acceptable pH buffering agent; and

c) applying the medical dressing to the skin injury or surface lesion of the human or animal patient thereby inhibiting the proliferation of a microbial infection thereof.

49. The method of Claim 48, wherein the antimicrobial composition of step b) further comprises vitamin E.

50. A kit for preparing an antimicrobial composition for inhibiting the proliferation of a microbial infection or microbial colonization of a skin injury or

surface lesion, comprising: packaging material comprising at least one vessel containing at least one pharmaceutically acceptable antimicrobial agent, at least one pharmaceutically acceptable chelating agent, at least one pharmaceutically acceptable pH buffering agent, and vitamin E, and instructions directing the use of the kit for preparing an antimicrobial composition for inhibiting the proliferation of a microbial population, and optionally for promoting tissue repair, of a skin injury or surface lesion of a human or animal.

51. The kit according to Claim 50, further comprising instructions directing the use of the kit for applying the antimicrobial composition to a skin injury or surface lesion of a human or animal to inhibit the proliferation of a microbial infection thereof.

52. The kit as in Claim 50, wherein the instructions direct the use of the antimicrobial composition for inhibiting an infection of a lesion of the oral mucosa of a human or animal patient.

53. The kit according to Claim 50, further comprising a medical dressing, and instructions directing the use of the kit for preparing and applying the antimicrobial composition to the medical dressing and delivering the medical dressing to a human or animal to inhibit the proliferation of a microbial infection.

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